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SCIENCE NEWS LETTER

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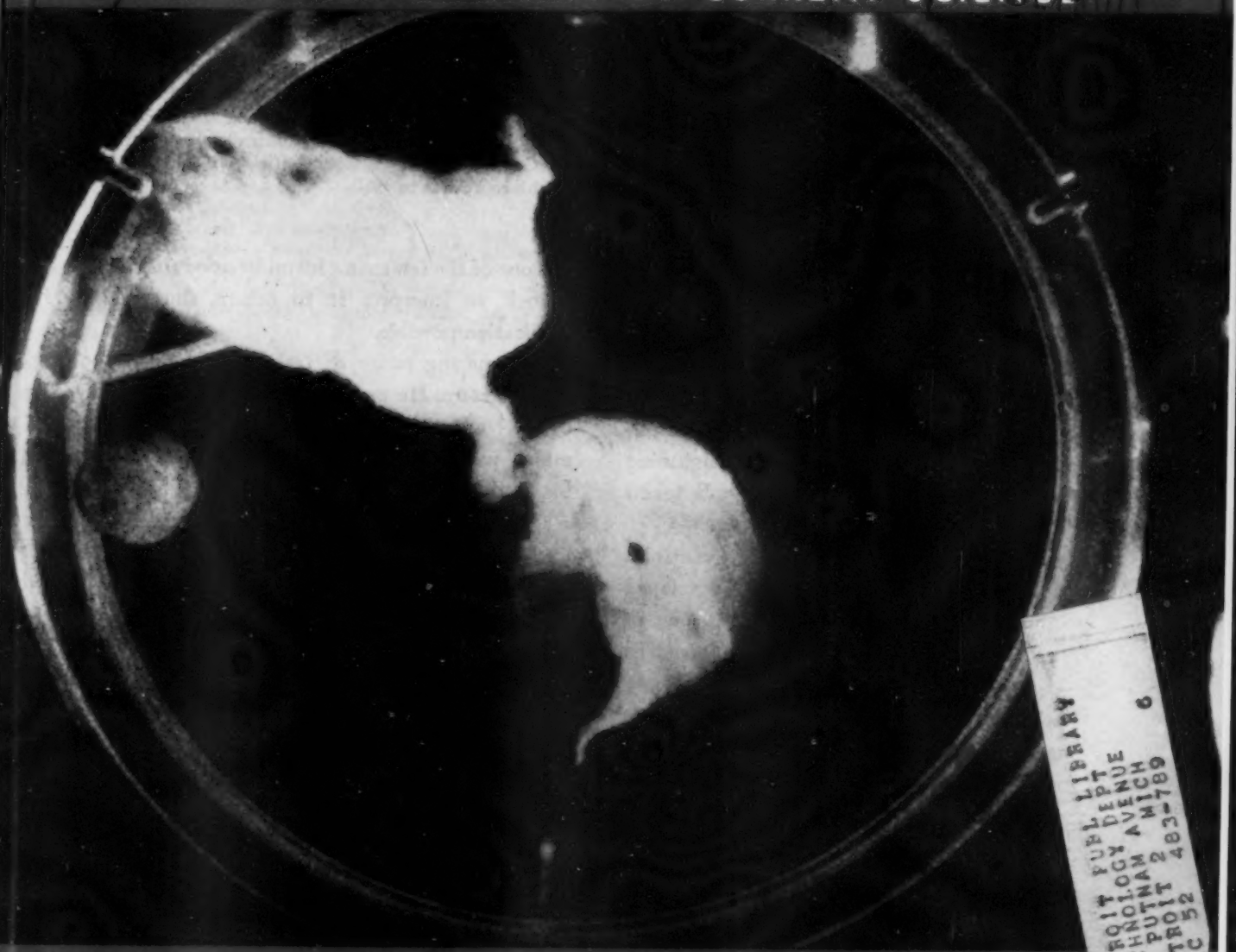
THE WEEKLY SUMMARY OF CURRENT SCIENCE



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Gravity Zero

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A SCIENCE SERVICE PUBLICATION

Adventurers in Research

John F. Peters

ENGINEER-SCIENTIST

One of the most brilliant engineering mathematicians in Westinghouse history. He started with Westinghouse in 1904 as an armature winder, and advanced rapidly to the point where he devoted his entire time to special engineering assignments. In 1926 he became the first Westinghouse-employe Consulting Engineer, which title he held until his retirement in 1950.

ONE DAY at Westinghouse in 1921, John Peters was called into the office of the Vice-President in charge of engineering. He was told, "We have to do something to get a better understanding of lightning. I want you to develop an instrument to measure lightning voltages." In a few months he returned with the klydonograph, which gave the impetus to a quarter century of lightning study, and for which he later received the Franklin Institute, Edward Longstreth Medal of Merit.

This special assignment is typical of those given John Peters. In his 46 years with Westinghouse, he developed scores of new devices and is recognized as one of the half-dozen best engineering mathematicians in Westinghouse history.

Yet this impressive record was compiled without benefit of an engineering education! In fact, John Peters' formal education ended with grade school.

Entirely self-taught, Peters was to see the day when experienced engineers stumped with a technical problem would "take it to John" for the answer. He played a little known, but vital part in the development and application of symmetrical components. The initial presentation of this now universally used form of mathematics was made by Dr. Fortescue in 1918. Peters was one of the few men who understood the subject well enough to interpret it to others, thus making its application possible.

An amazing range of tasks has befallen problem-solver Peters. He proved mathematically that heating of steel billets electrically was impractical. He was a major participant in the application of the world's biggest homopolar generator for pipe welding. For years, all inventors calling at Westinghouse were turned over to John Peters for him to locate the flaw—if any—in their proposals. When World War II came, he worked on gun-fire computers that are so complex as to cause most engineers to shudder.

Now, in post-retirement, he is engaged in a variety of defense projects. The newest is one that has thus far "stumped the experts"—a secret device related to nuclear-energy development. John wanted to rest—but the challenge of this "impossible job" has been too much to resist.

His has been a long career, rich in technical accomplishment. Westinghouse is proud of John Peters. It is men like him who have made America's industrial progress possible. Westinghouse Electric Corporation, Pittsburgh, Pennsylvania. G-10240

YOU CAN BE SURE... IF IT'S Westinghouse

MEDICINE

Lasker Health Awards

Dentists, for the first time, receive Lasker Awards for work on fluoridation of water to prevent dental decay. Dr. C.-E. A. Winslow given special award for his untiring efforts.

➤ CONTRIBUTIONS TO better health through work in fields ranging from sanitation to psychiatry, and including vitamins, viruses, teeth and rehabilitation are recognized in this year's Lasker Awards of the American Public Health Association.

For the first time, dentists get one of these $1,000 awards plus a gold statuette of the Winged Victory of Samothrace. The dentists are Dr. Frederick S. McKay of Colorado Springs, Colo., who showed the relation between mottled enamel of teeth and a then undetermined substance in drinking water consumed in childhood, and noted the resistance of mottled teeth to decay, and Dr. H. Trendley Dean, director of the National Institute of Dental Research, U. S. Public Health Service, Washington, who, through research and leadership in program planning, developed Dr. McKay's observations into the present widespread program of fluoridation of water supplies to control tooth decay.

Nicotinic acid, the vitamin that cures and prevents pellagra which once was rampant in our southern states and other parts of the world, was first isolated by Dr. Conrad A. Elvehjem, chairman of the biochemistry department, University of Wisconsin. For this and basic research showing the need for copper, zinc and manganese in animal diets, and that the amino acid, tryptophan, is partly interchangeable with nicotinic acid as a nutrient, Dr. Elvehjem receives one of this year's Lasker Awards.

A special award of $2,500 goes to Dr. Chas.-Edw. Amory Winslow of Yale University. For more than half a century Dr. Winslow has been the inspiration, leader and teacher of a generation of public health workers in what has been called the "sanitary revolution of our time." Much of the health protection and disease prevention public health departments furnish today, and which the average citizen takes for granted, is owing to Dr. Winslow's studies and teachings.

Viruses, causes of diseases such as influenza, colds, poliomyelitis and many others, are today better understood and therefore becoming more vulnerable to man's attack on them through research by another of this year's award winners, Sir Macfarlane Burnet, director of the Walter and Eliza Hall Institute of Research, Melbourne, Australia. While much of Dr. Burnet's work is known only to fellow scientists, many lay persons know "Q" fever. The cause of this disease was one of Dr. Burnet's discoveries.

If there has been less of war's usual aftermath in sickness, crippling physical disabilities, and emotional warping leading to disunity after World War II, it is due in part to the efforts of two other of this year's Lasker Award winners, Dr. Brock Chisholm of Toronto, Canada, director general of the World Health Organization, and Dr. Howard A. Rusk, director of the Institute of Physical Medicine and Rehabilitation of New York University-Bellevue Medical Center, New York.

Dr. Chisholm, a practising psychiatrist before the war, is now using psychiatry and public health in a world-wide effort to achieve everywhere the healthy minds in healthy bodies that will help toward lasting peace.

With the Air Force during World War II, Dr. Rusk developed methods for returning disabled airmen to combat and to useful futures. Since the war he has been a leader in applying these methods to rehabilitation of millions of disabled civilians while his pioneer teaching continues to be applied to our war wounded.

The Lasker Awards have been made annually since 1946. They are given to acknowledge research or other contributions in the fight against those diseases that are the main causes of death and disability, and for distinguished service in the field of public health administration.

Thirty-four scientists and public health leaders and 13 medical groups have previously received awards.

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SURGERY

Fingers Reconstructed From Palm of Hand

➤ IF YOU should be unlucky enough to lose all the fingers on both your hands, surgeons can cut new ones for you in the palms of your hands.

Success with this surgery in one patient was reported by Dr. William H. Frackelton of Marquette University, Milwaukee, Wis., at the meeting of the American Society of Plastic and Reconstructive Surgery in New York.

The patient, Marion Cody, 42-year-old engineer of Milwaukee, had to have all ten digits cut off after they had become frostbitten while on an Alaskan hunting trip. In two operations on each hand, clefts between the finger stumps were cut deep into the palms and lined with skin grafts, Dr. Frackelton reported. Tendons were transferred to give added mobility to the new fingers.

Vocational training helped Mr. Cody learn to use his new fingers so well that eight months after the first operation he got a job with a local steel company, though before the operation he could not even feed or dress himself.

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DECAY PREVENTION—Dr. Frederick S. McKay, co-winner with Dr. H. Trendley Dean of the U. S. Public Health Service of the first Lasker Awards to go to dentists, examines the teeth of a small neighbor in Colorado Springs, Colo.

AERONAUTICS

Inter-City Helicopter

➤ HELICOPTER DEVELOPMENT has advanced to a point where this type of aircraft will soon be able to replace ordinary airplanes on inter-city trips up to 350 miles in length, the Society of Automotive Engineers meeting in Los Angeles was told by Frank N. Piasecki of the Piasecki Helicopter Corporation, Morton, Pa. Such helicopters will have a capacity up to 50 passengers.

Main jobs for helicopters as a civilian craft in the near future include acting as feeders carrying passengers from in-town heliports to nearby airports, and serving as transports between cities up to 350 miles apart, he indicated.

For the traveler moving between the downtown centers of two cities, he said, a 300-mile-an-hour airplane is not as fast as a 125-mile-an-hour helicopter on trips up to 260 miles in length. This is because the helicopter can fly in and out of city centers, while the airplane uses airports which average a 35-minute trip at each end by automobile.

The helicopter is a relatively new type of aircraft. The idea of a rotary-wing craft is perhaps centuries old, but only ten years ago did the helicopter establish for itself a definite place in aviation. That was in May, 1942, when an experimental Sikorsky helicopter made a successful trip, in 15 hops, from Stratford, Conn., to Dayton, Ohio.

In the past ten years helicopter development has been rapid. They now carry payloads 15 times greater than earlier types. Range is six times greater and cruising speeds have doubled. A 40-passenger helicopter under construction by Piasecki Corporation for the U. S. Air Force will be ready for flight later this year.

Before helicopters come into wide use as civilian transports, there must be new air traffic rules to accommodate them, Mr. Piasecki stated. Blind flying and navigation aids must be provided for them. Weather forecasts must be made more often and must be more localized. Then the entire problem of downtown heliports must be explored.

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NUTRITION

Food for Teen-Agers

➤ CHILDREN THESE days are encouraged to be independent, to decide and do things for themselves as soon as they are able. By the time they reach their teens many are buying their own clothes and making other decisions, including what to eat.

The way they do their hair or the clothes they wear may not be too pleasing to grown-up tastes, but Mother and Daddy usually leave hands off. When it comes to the diet chosen, the matter is more serious because the teen-ager's nutrition and health may be affected. And teen-agers do rather badly in choosing foods, nutritionists of the U. S. Department of Agriculture find.

For example, a study of teen-age diets in Maine showed that both girls and boys were apt to run low in vitamin C and calcium. Girls also were low in iron and generally had less of several other important nutrients than boys.

A study of diets in Chicago families showed that high school children had less milk and fewer servings of fruits, vegetables, meat, poultry and eggs than elementary school children. Tenth-graders in a New York State study had less of the protein needed for their age than fourth-graders—and had less milk and fewer fruits and vegetables high in vitamin C.

Among 30,000 school children in another study, those aged 12 to 17 years came out shortest on milk, green and yellow vegetables, and citrus fruit. Again in studies of children in Tennessee, New York and Maryland, older children were less likely to get their quotas of calcium and vitamins A and C than those under 9 years.

Even in Alaska, children over 10 years had poorer diets than younger children. In four Eskimo villages, those over 10 years, especially teen-age girls, drank less milk and had too little of the calcium essential for growth and well-being.

As a remedy, the nutritionists suggest nutrition, or scientific eating, as a hobby for the teen-age group.

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VETERINARY MEDICINE

Livestock Diseases Now Near Dangerous Peak

➤ THE PEAK period in a new cycle of livestock diseases in America is foreseen by officials of the American Veterinary Medical Association in Chicago.

"The livestock industry has seldom been faced with as great an assortment of threatening contagious diseases as it is at the present time," association officials declare in reviewing the disease threats that have taken a heavy toll in the nation's barnyards this year.

"These diseases have been on the increase during the past two or three years. Not all are new, but those that are not new have at least developed some new aspects," it is stated.

The list of threatening diseases includes:

Anthrax, with new and unusual epidemics occurring in many swine herds in recent months.

Vesicular exanthema, which spread from coast to coast during the summer and forced quarantine of swine shipments in some areas.

Air sac disease of poultry, a new threat on the eastern seaboard.

Anaplasmosis of cattle, which has infiltrated the northern states.

Leptospirosis, a spreading blood disease of cattle.

Rabies, which continues to spread as a threat both to animals and man.

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DEEP-WATER CRAB—Found in abundance off the New England coast, a red crab is displayed by William C. Schroeder, leader of the Woods Hole Oceanographic Institution's deep-water fishing exploratory cruise.

MARINE BIOLOGY

Deep-Water Fish

Discover redfish, lobsters and crabs can be fished off New England coast at greater depths than previously reported. Numerous other rare fishes also were taken.

➤ DISCOVERIES OF a new and prolific fishing ground for redfish, plentiful lobsters at greater depths than ever reported and abundant quantities of succulent red crab were reported by the Woods Hole Oceanographic Institution, Woods Hole, Mass.

The finds were made off the New England coast during three summer cruises of the 83-foot dragger, the Cap'n Bill II, under the leadership of William C. Schroeder of the Institution and Harvard University.

"A virgin territory" for redfish, the rosefish that is filleted to be sold as "ocean perch," lies southeast of Halifax, Nova Scotia, in depths greater than 1,800 feet, Mr. Schroeder stated.

Redfish caught there run 30 to 35 fish per bushel and measure 14 to 19 inches long. Most redfish now being brought into port run 10 to 12 inches long.

The most successful lobster hauls, market-sized one and one-half to six pounders, were made south of Martha's Vineyard at about 600-foot depths, Mr. Schroeder states. He estimates that possibly 5,000 pounds of lobsters might be taken with a commercial trawl in several days of fishing.

Crabs with an excellent, sweet taste, which as a canned product should equal any now marketed, were found in large quantities at depths from 1,100 to 3,100 feet during the entire cruise, from offshore New York to Nova Scotia. The larger ones, Mr. Schroeder reports, weigh one and one-half to two pounds, have a leg spread of about 20 to 24 inches and produce about one-fourth of a pound of meat, mostly in the legs.

Many rare fish were also taken during the deep-water trawling, among them 20 chimaera, a species new to science. The chimaera, a relative of the sharks and skates, lives exclusively in very deep waters. It is rarely caught except in the Pacific.

Among numerous other rare fishes still to be studied, the most remarkable is a bony fish which has defied classification and may represent a new family of fishes.

If the so-called trash fish should become depleted in shallow water, good quantities of long finned hake and grenadiers can be found in depths beyond 900 feet. The small experimental trawls yielded as much as 8 to 10 bushels of these species per haul.

Commercial fishermen fishing in the deeper waters could also expect to catch small numbers of grey sole and an occasional halibut.

Results of the cruises were sufficiently encouraging to plan for additional work during the summer of 1953 when even deeper trawling may be attempted.

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MEDICINE

To Treat or Not Is High Blood Pressure Problem

➤ THE MOST important thing in treating patients with high blood pressure is to recognize those patients who either do not need treatment or are likely to be made worse by it, Dr. Robert Sterling Palmer, head of the hypertension clinic, Massachusetts General Hospital, Boston, declared at the meeting of the Medical Society of the District of Columbia in Washington.

The use of drugs to lower blood pressure is "open to question" in some cases, he said.

In less severe degrees of hypertension, reducing diets for the overweight, milder degrees of salt restriction and sedative drugs all may be advisable.

Psychiatric treatment and rules of hygiene may be most important.

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PHYSICS

Battery Made From Nickel, Penny, Paper

➤ A NICKEL, a penny and a piece of moist paper make a tiny but effective battery, an engineer from Minneapolis-Honeywell Regulator Co. in Philadelphia has found.

While out in the field, he had to make a quick test of an amplifier, but lacked the usual test equipment. Applying some high school physics, he inserted a one-inch square of moist paper between a copper penny and a nickel five-cent piece. The difference in the electrical properties of the two metals set up a tiny electric current. The current was enough to cause a balancing motor to move in opposite directions when the positions of the amplifier's lead wires on the two coins were reversed. His six-cent battery thus proved the amplifier operative.

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SURGERY

Cancer of Esophagus Cured With Skin Graft

➤ CANCER OF the gullet, or esophagus, in the neck can be cured. The cancerous portion of the food passage can be cut out and a new passage made so the patient can eat and swallow.

Skin grafted from the abdomen and skin grafts from the sides of the neck is one way of making a new esophagus in such cases. Four out of 26 patients who have had this operation appeared with Drs. William L. Watson of Memorial Hospital and John M. Convers of Manhattan Eye, Ear and Throat Hospital, New York, at the meeting of the American Society of Plastic and Reconstructive Surgery in the same city.

One of the patients is a 61-year-old woman, free from disease and able to eat normally 12 years after removal of her cancer. Another has gained 70 pounds within the past three years.

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GENERAL SCIENCE

Teaching Attracts Low I.Q.

Studies of marks achieved in Army General Classification Test show that of the bottom one-fifth of all graduate students, nearly half are in education.

➤ SCHOOL TEACHING attracts the least bright students, the natural sciences attract the brightest.

These are some of the conclusions based on studies of the marks achieved in the Army General Classification Test by groups of college graduates, graduate students and Ph.D.'s specializing in almost all fields of learning.

Of the bottom one-fifth of all graduate students, in terms of AGCT marks, 46% are in education. Of the top one-fifth, 18% are in the natural sciences.

"One of the sad effects of the low salaries and low prestige accorded to the nation's school teachers," the study says, "is the fact that nearly half of the lowest fifth of graduate students in the country are working for advanced degrees in education. They will be guiding the development and influencing the career choices of the next generation of students."

The average person who earns a bachelor's degree earns a score of 126 on the AGCT test, the study shows. The average person in the general population has a score of 100. Only about 10% of the general population could achieve a score above 126. The average graduate student scores around 129, and the average Ph.D. in the sciences scores around 138. Only about 2% of the general population can score higher than that.

The lower 25% of all students who earn a bachelor's degree would not pass the Selective Service college deferment test, the study's figures show. To be deferred, a student has to achieve a mark equal to 120 on the AGCT scale.

The most rarefied atmosphere seems to be in the psychology field, where one-tenth of the Ph.D.'s earn scores of 163 or better. However, the highest median score, 132, for those who have earned bachelor degrees is in the physical sciences, except chemistry, while the lowest median score is in physical education, 117.

The study is reported in *Science* (Sept. 26) by Dr. Dael Wolfle and Toby Oxtoby of the Commission on Human Resources and Advanced Training, Washington.

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GENERAL SCIENCE

Tax Non-Profit Research

➤ RESEARCH THAT is carried on for the primary purpose of commercial or industrial applications is going to pay income taxes, beginning with the 1951 tax year, even if it is conducted by non-profit organizations.

A new ruling of the Bureau of Internal Revenue has canceled the tax immunity for all but fundamental research, and this even applies to universities, foundations, institutes and other such organizations.

Commercial laboratories, whose trade association has been urging such taxation for several years, will thus be relieved of what they consider competition from non-taxed organizations.

The organizations that are deprived of their tax privileges will undoubtedly take the matter to the courts but meanwhile there may be indecision as to what research can and can not be done tax-free under the new regulation.

Research, in the bureau's ruling, does not include activities of the type ordinarily carried on as an incidence to commercial or industrial operations. As an example, there is specified ordinary testing or inspection of materials or products, or the designing or construction of equipment and buildings. Fundamental research does not include, in the bureau's opinion, work that is carried on for commercial or industrial applications.

The new ruling followed action by Congress that applied to colleges and universities federal taxation upon activities that are not related to education.

There are about 300 commercial laboratories, some large and some small, and most of them do work for companies that do not have their own laboratories or desire research done to supplement their own efforts.

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PHYSICS

Gravity-Free State Found Unharmful for Brief Time

See Front Cover

➤ MAN MAY be able to stand for brief periods the gravity-free state expected in rocket flight to the outer atmosphere if he has something to hang onto, Air Force experiments with mammals in Aerobee rockets show.

The Air Force revealed last March (see SNL, March 29, p. 194) that live animals, both mice and monkeys, had been rocketed to altitudes of 80 miles, but the first pictures taken on a later, May 22, flight have just been released.

They reveal the struggles of two white mice at 38 miles above the earth. Shown on the cover of this week's SCIENCE NEWS LETTER is one picture, made shortly after the rocket head was separated and two minutes of zero gravity, taken from the movie film.

One mouse is floating helplessly in a smooth-sided plastic drum, unable to gain a foothold.

But in the adjoining section of the drum that has a shelf, another mouse was able to take a firm hold, stay calm and keep his equilibrium during the weightless period. Note that the ball is suspended in air, away from the sides of the drum.

The monkeys and mice showed no unusual effects from the flight, although they were subjected to a brief, one-second acceleration of about 15 g and a force of 3 to 4 g, lasting for 45 seconds. The monkeys were anesthetized to prevent their disturbing the instruments that recorded their reactions.

From these experiments at Holloman Air Force Base, Alamogordo, N. Mex., plus several human experiments in jet fighters, the Air Research and Development Command has concluded that a man, properly secured in an aircraft, can "function normally during brief periods of zero gravity and perform any operations necessary in piloting an aircraft."

There are, the Air Force warned, differences between mice and men, and the results obtained from the mice and monkeys sent up in V-2 and Aerobee rockets can only be applied with caution.

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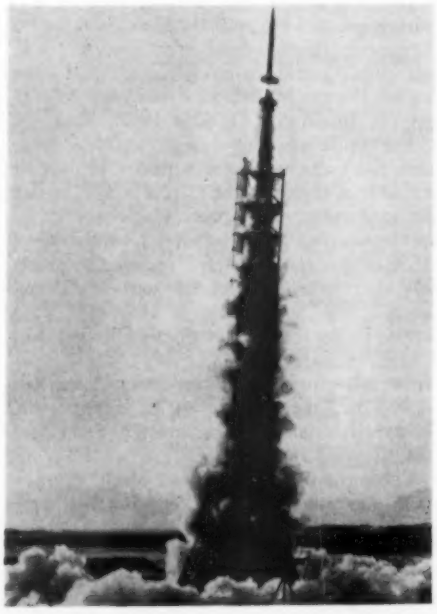

HEADED FOR SPACE — An Aerobee rocket leaving the launching tower during an experiment to test reactions of animals at zero gravity.

REQUIRED FOOD FACTORS—Dr. Conrad A. Elvehjem, Lasker Award winner of the University of Wisconsin, watches William Leoschke conduct a feeding experiment with a mink. From differences in diet requirements among animals, scientists can sometimes glean clues to new vitamins, amino acids and other nutrients. Dr. Elvehjem was the first to isolate nicotinic acid as an essential nutrient.

ARCHAEOLOGY

Jericho Is Oldest Town

➤ THE BIBLICAL town of Jericho, with its walls that came tumbling down before the blasts of Joshua's trumpets and the shouts of his men, is now believed to be the oldest town in the world, with a continuous history of at least 6,000 years.

This is revealed by excavations being conducted jointly by the British School of Archaeology in Jerusalem, under the direction of Dr. Kathleen M. Kenyon, and the American Schools of Oriental Research.

The wall brought down so dramatically by Joshua was only one of a long succession of city walls, built one on top of another. Deepest one found dates back at least 6,000 years, if not more, and is built of tremendous undressed stones.

Enclosed by the wall were buildings solidly constructed of plastered mud-brick walls and floors put together with mud mortar of the same consistency. In most cases the bricks were plain slabs of irregular size, but in some walls, long cigar-shaped bricks were used. These bricks were flattened top and bottom and decorated with impressions of the brickmaker's two thumbs in a herringbone pattern.

These houses were erected and the wall was built for defense back in the New Stone Age before men had learned to make pots.

"It is a revolutionary idea in our knowledge of the development of settled occupation," says Dr. Kenyon in reporting the finds in the British journal *Antiquity* (Sept.), "that the stage of community organization involved in the construction of a town wall was reached before the invention of pottery."

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PHYSICS

Dunk It, Jolt It, Radio Still Works

➤ YOU CAN dunk it in water, throw it around, feed it electricity from power line, dry or storage battery, and it will still bring in the radio messages.

The latest communication receiver in mass production for the Army's Signal Corps for vehicles and fixed installations is that tough and reliable, Emerson Radio and Phonograph Corporation declared in New York.

It operates on various channels. The heat and fungi of the tropics cannot put it out of commission.

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PHYSICS

Nuclei and Pi Mesons New Atom Types

➤ THE EXISTENCE of new types of atoms composed of nuclei and negatively charged pi mesons, mysterious, short-lived particles intimately associated with the forces holding the nucleus of the atom together, has been established by University of Rochester nuclear physicists with the detection of mesic X-rays from carbon and oxygen mesic atoms.

These mesic X-rays, 280 times more powerful than the commonly known electronic X-rays, are emitted when the negative pi meson jumps from one stable orbit to another of the mesic atom.

One result of the mesic X-ray discovery is that, for the first time, it establishes a direct comparison between the electrical and the nuclear forces acting upon pi mesons.

Existence of the X-rays was confirmed by a group headed by Dr. Joseph B. Platt, associate professor of physics, during the course of a long series of complicated high-energy experiments using the university's large 240-million-volt synchrocyclotron. Dr. Platt's co-workers were Dr. Morton Camac, Harry J. Schulte and Austin McGuire.

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SURGERY

Skin Flap Feeds More Blood to Failing Hearts

➤ A WAY to supply more blood to failing hearts was demonstrated by Drs. Charles G. Neumann and Jere W. Lord, Jr., of New York University Post-Graduate Medical School, New York, and Dr. Robert E. Moran, plastic surgeon of Washington, D. C., at the meeting of the American College of Surgeons in New York.

The method makes use of a flap of skin from the abdomen which is shaped into a tube between the chest wall and the heart. This pedicle skin flap, as it is called, is sewed to the heart muscle. The skin flap is designed to carry a new blood supply to a heart that is not getting enough blood because the artery supplying its muscle has been blocked or constricted.

The idea of using a skin flap for this purpose came from Dr. Moran. Several years ago when trying to transplant a skin flap from one person to a close blood relative with the same blood type, he found that the donor, four days after the transplantation, developed shock and anemia. A large volume of the donor's blood, it turned out, was going through the skin graft tube. The amount of blood which this tube could transport suggested that a skin flap might be a successful vehicle for carrying a new blood supply to the heart.

Details of the experiments to develop this operation are reported simultaneously by Drs. Neumann, Lord, Moran and Jerrold von Wedel, Peter W. Stone and J. William Hinton of New York in *Science* (Sept. 26).

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PSYCHOLOGY

Mental Test Coaching Does Not Raise Scores

➤ DO NOT waste your time trying to make your child seem to be a genius by coaching him in intelligence tests. It will not do any good, A. Yates, research officer of Britain's National Foundation for Educational Research, has reported to the British Association for the Advancement of Science meeting in Belfast.

Experiments in which children were given intensive coaching and instruction in the performance of intelligence tests have shown that their scores were raised only about 8 to 10 points, barely more than the gain made by another uncoached group of children who were permitted practice tests before taking the final test.

Even this short gain was not lasting, having been all but wiped out in a six-month interval after the coaching.

There is the chance of doing the child more harm than good by continued hammering away at practice, for there is some evidence of the tendency for the scores of some individuals to fall away, if practice is continued after the optimum score has been reached.

Mr. Yates also disagrees with the trend in some quarters to advocate universal coaching in intelligence tests in schools to wipe out any supposed advantage gained by children who are coached by their parents at home. He has found that teachers vary in their ability to produce gains by coaching and pupils vary in their ability to register gains, so that any universal coaching is likely to produce erratic results and even greater unfairness than that which over-ambitious parents may conceivably bring about.

Science News Letter, October 11, 1952

PSYCHOLOGY

Do Not Worry About Insomnia

➤ DON'T WORRY about insomnia. Do something about it. If you have always been a sound sleeper and find, now, that you cannot get to sleep easily or awaken in the middle of the night and lie tossing for hours, see your doctor. There may be a physical cause for your insomnia, such as muscle cramps, cold feet or gas pains, or something more serious. More often, however, the cause turns out to be some worry or emotional conflict.

"Sleep disturbances are among the commonest signs of emotional tensions," says Dr. Robert T. Porter of New York.

"It has often been noted by medical teachers that when there are many treatments for one condition, none are really fully satisfactory," he observes. "The number of patent remedies, diet formulas, special mattresses, ear-stoppers and other gadgets, as well as books and phonograph records advertised to assist sleep clearly labels insomnia as one of these conditions for which no entirely satisfactory treatment has yet been established.

"For the less severe cases, perhaps almost any of the methods may help. Some of the more severe cases, however, do not respond adequately to symptomatic measures.

"Sleep-inducing drugs may bring sleep if used in large enough dosages. But if they are having to overcome severe anxiety or tension, drug tolerance may speedily develop so that, to maintain effectiveness, larger and larger dosages would be required, and this cannot be pursued indefinitely. In these more resistant cases it is therefore logical to try to treat the emotional problems which may be producing the insomnia."

Science News Letter, October 11, 1952

VETERINARY MEDICINE

Cook Garbage to Stop Pig Epidemics

➤ GARBAGE COOKING can be an important weapon in defense against two serious diseases: trichinosis, which humans get from infected pork, and VE, short for vesicular exanthema, which was epidemic among swine in 24 states during this past summer.

VE does not attack humans, though slaughter programs to control it could make pork scarcer and more expensive.

Both diseases are spread largely by the commercial feeding of raw garbage to swine.

Interstate quarantine regulations enforced by the U. S. Public Health Service require that garbage transported across state lines for swine-feeding purposes must be given heat treatment. State laws are needed, however, to control the situation for garbage collected and fed to swine within the state.

The trichinosis and VE problems are so serious that the Public Health Service and the Department of Agriculture are planning a cooperative effort to push garbage cooking for swine.

Science News Letter, October 11, 1952

NUTRITION

How to Pack Lunches For Week at a Time

➤ WHETHER SANDWICHES for Dad and for the school children's lunch can be made up a week in advance, then kept in the freezer is being studied by food technologists at Rutgers University, New Brunswick, N. J.

They want to find out what happens to peanut butter or egg salad sandwiches when they have been frozen for a week. They hope to show that homemakers could save time and trouble by making many sandwiches at one time, then storing them frozen until needed.

Fruit pies are generally better if frozen first and then baked; custard pies should be baked first, then frozen, Dr. Walter A. Maclinn of Rutgers reports.

Science News Letter, October 11, 1952

IN SCIENCE

GENERAL SCIENCE

Rockefeller Foundation Curbs Science Funds

➤ A CHANGE in program, with a reduction in allotment of funds for natural sciences research in the United States, is announced by the Rockefeller Foundation, New York.

The change, made as a result of a year-long survey, is intended to meet post-war conditions. Under the new program, future budgets are expected to allot $500,000 for natural sciences research in the United States, the same amount for Europe, $700,000 for Latin America, and $1,500,000, or 47%, for "operating agriculture."

Outside funds now available to universities and other institutions for basic research in biology now total around $25,000,000 a year, Chester I. Barnard, who retired as president of the Foundation in July, 1952, points out in his last review.

This is 10 to 12 times the amount that was available when the Rockefeller Foundation entered on its program of aid to experimental biology 19 years ago.

The Foundation, therefore, is going to concentrate its work in support of projects designed to put into effect the results of research for improvement of agriculture in various regions of the world.

Science News Letter, October 11, 1952

AERONAUTICS

Turboprop Gives Speeds Up to 1,000 Miles an Hour

➤ AIRPLANE SPEEDS well above that of sound are promised with a new turboprop engine and special propellers developed by the Curtiss-Wright Corporation, Wood-Ridge, N. J. The combination will eventually permit speeds up to 1,000 miles an hour, it is claimed.

Turboprop engines are similar to the turbojets that power ordinary jet planes, but the high-pressure gases they generate are directed against vanes on a shaft to cause rotation. The shaft, in turn, drives conventional bladed propellers. Turboprops are already in experimental use in some airplanes. This new engine is said to be more powerful than those now employed, although its horsepower is not revealed.

The new propellers are capable of harnessing power up to 20,000 horsepower or more. They are hollow-steel, produced by an extrusion process perfected by Curtiss-Wright engineers. They range up to 20 feet in diameter. Some are three- and four-bladed, and some are six- and eight-bladed. Some give single rotation, while others give dual rotation.

Science News Letter, October 11, 1952

ENCE FIELDS

PHYSIOLOGY

No One Can Drink Quart 100-Proof Daily

➤ IF SOMEONE tells you he can drink a quart or more of 100-proof liquor a day, do not believe him. He might, if he is a chronic alcoholic, be able to drink a fifth of 100-proof liquor in 24 hours, but no more.

Studies showing this are reported by Drs. Henry W. Newman, Roger H. L. Wilson and Edith J. Newman of Stanford University School of Medicine, San Francisco, *Science* (Sept. 26).

Earlier, Dr. Henry Newman had reported on the basis of dog studies that an average-weight man might consume a quart of 100-proof liquor in 24 hours. The amount is slightly less. He and his colleagues find from direct experiments on three men and one woman that it is 760 milliliters, or about four-fifths of a quart.

The woman and one man were chronic alcoholics, the other two men were moderate drinkers. In the studies, each got either diluted alcohol or "an acceptable alcoholic beverage" every hour for several days. Tests of the alcohol level in the blood or saliva gave figures from which the scientists could determine exactly how much alcohol each of the four persons tested could handle in their bodies in 24 hours.

For the woman, this was slightly less than a pint, 383 milliliters, and for the two moderate men drinkers, the figures were 608 and 524 milliliters, both somewhat under a quart. The male alcoholic in the study consumed the highest amount, 760 milliliters.

Science News Letter, October 11, 1952

PUBLIC SAFETY

Be Sure Your Sweaters Do Not Go Up in Flames

➤ TO GUARD yourself and your family from serious, perhaps fatal, clothing burns, ask stores where you shop for your new fall clothes if the sweaters or clothing you are buying have passed flammability tests.

This is the best way to be sure that you do not get any clothing dangerously likely to go up in flames, Roger M. Wingate of the National Fire Protection Association reports. The Association, made up of representatives of government agencies, retailers and manufacturers, is trying to establish, by scientific tests, a standard that will show exactly how flammable fabrics are.

Even with these tests, however, Mr. Wingate, vice-president of Liberty Mutual Fire Insurance Co., Boston, said that the most important thing is for the consumers to demand that their clothing meet the minimum standards. These depend on the rate at which fabrics burn, for it is the rapid burning of clothes that most often causes the serious or fatal burns. About one-third of the 12,000 deaths from fire burns each year are due to those from clothing.

Many materials that are a menace to human life are sold in every store throughout the country without any warning that they are highly flammable. Last year's torch sweaters and the cowboy suits sold a few years ago are examples.

How fast the dress or suit you are wearing will burn depends not only on the material, but on how that material has been treated. It is the brushing, not the rayon, that makes brushed rayon sweaters flare up like torches. Cotton materials with a similar nap are just as flammable as rayon. But flat weave cotton or rayon, sheeting, and cotton or rayon prints are not dangerously flammable.

Science News Letter, October 11, 1952

TECHNOLOGY

X-Ray Inspection To Help Keep GI's Alive

➤ AN AUTOMATIC X-ray machine that peers inside of hand grenades with its electronic eye soon may help to make the death-laden missiles explode inside of Chinese Communist pillboxes instead of in a GI's hand.

Just completed in Milwaukee under the supervision of Arthur J. Kizaur of the General Electric's X-ray department, the machine can spot a ⅛-inch discrepancy in the fuse powder level, an inaccuracy that can mean life or death to the grenade thrower.

Rays from a 100,000-volt X-ray unit go through the grenade, scanning the fuse powder level as they pass. They emerge on the opposite side of the grenade and strike an X-ray sensitive cell filled with cadmium sulfide crystals.

If the powder level is low by as much as ⅛ of an inch, the cadmium sulfide crystals emit torrents of electrons that operate a rejection lever. The faulty hand grenade then is discarded from the production line automatically.

Science News Letter, October 11, 1952

DENTISTRY

Abscessed Teeth Saved By Treatment Method

➤ ALMOST THREE-FOURTHS of teeth abscessed and decayed to the pulp can be saved, if a treatment method reported to the American Dental Association in Chicago comes up to its present promise.

The method consists in removing the exposed portion of the pulp, treating the remaining portion with medicines and then filling the cavity.

A 72% success with the treatment over a year's period is reported by Dr. Donald B. Chatterton of San Diego, Calif.

Science News Letter, October 11, 1952

MEDICINE

Future Antibiotics Aimed at Specific Germs

➤ ANTIBIOTICS, THE so-called mold remedies, in the future will be anti-germ ammunition of a kind to fit a rifle rather than a shotgun, Graydon L. Walker, director of U. S. and Canadian sales for Parke, Davis and Co., Detroit, predicted at a meeting of pharmacists in New York.

Scientists and drug houses now, he said, seem to be interested in finding new antibiotics that are effective against one or at most very few germs, instead of searching, as in the past, for an antibiotic that could stop as many different germs as possible.

"Very substantial" basic research on blood and blood-forming tissues is now being financed by his firm, Mr. Walker revealed. The object is to help doctors find what causes blood disorders such as aplastic anemia. Development of this sometimes fatal blood disease in patients who had gotten Chloromycetin, a Parke, Davis and Co. antibiotic drug, either off and on or over a prolonged period, led recently to an extensive review of thousands of case histories by the Food and Drug Administration and the National Research Council. Chloromycetin was cleared with no restrictions on the number of diseases in which doctors can give it, but with the caution that it should not be used indiscriminately or for minor infections.

Much more information is needed, Mr. Walker said, on both the causes of such blood disorders, and the number of cases of them in the population generally as well as in patients who have been given Chloromycetin or other antibiotics.

Science News Letter, October 11, 1952

MEDICINE

Chemical Prevents Blood Clot in Veins

➤ GOOD RESULTS with a new synthetic anti-blood clotting chemical are reported by Drs. Donald A. Scholz and Nelson W. Barker of the Mayo Clinic and Foundation, Rochester, Minn. The drug may prove useful in preventing blood clots in veins.

It is called Treburon. It is the sodium salt of sulfated polygalacturonic acid methyl ester methyl glycoside.

It has from one-third to one-fourth the power of heparin, naturally occurring body chemical that slows the rate of blood clotting.

Mild nausea and tingling of the fingers were the only signs of bad reactions to the drug, and these appeared in only one of 12 patients and did not last long.

The study of Treburon at the Mayo Clinic followed reports from scientists of Hoffmann-La Roche, Inc., of its effects on rabbits, and of tests on patients by scientists at Marquette University School of Medicine, Milwaukee.

Science News Letter, October 11, 1952

TECHNOLOGY

Billion Pounds of Soot

Nearly a billion pounds of carbon black added to rubber each year to produce better tires. Seventy million pounds used in printing newspapers, magazines and books.

By MARTHA G. MORROW

➤ CARBON BLACK, the fluffy, velvety soot produced when natural gas or oil is incompletely burned, is serving man in hundreds of ways:

Nearly one billion pounds of carbon black are added to rubber each year to make your tires wear better.

Seventy million pounds of carbon black are used in printing newspapers, magazines and books.

Twenty million pounds reinforce and color paints.

Carbon black is useful because it reinforces not just rubber, but also cement, lacquer and asphalt. Its great ability to absorb light provides blackness in paints, papers and inks. Its power to adsorb chemicals makes it useful in collecting gases and stray electrons in radio tubes. Its affinity for oxygen is used in reducing metallic alloys.

You probably have seen carbon black in dozens of products without realizing it. Most black candies and cough drops are colored with it. Black carbon paper and typewriter ribbons are effective because of carbon black. Black shoes, rubbers, raincoats, telephones, shoe polish and crayons are black because of it; phonograph records and combs often contain it.

A little carbon black improves the insulating properties of rubber and other substances because of its enormous adsorptive surface. But used in large quantities, carbon black is a good conductor of electricity and helps rubber, resins and paper transmit electricity. Carbon black itself is used in dry cells, radio resistors and arc carbons because of its great electrical conductivity.

Fluffy carbon black is used as a sponge to make roofing asphalts and lubricants flow less easily. It is employed in making metal carbides, such as tungsten carbide, useful as abrasives because of their hardness. Carbon black combines with liquid oxygen to make a powerful explosive.

Soot From Candle and Spoon

You probably remember that soot soon collects on a metal spoon, knife blade or letter opener held in the flame of a candle. If you hold the spoon high above the flame, there is little smoke and little black deposited on it. But when you put the spoon in the flame, thick black smoke rises from the burning candle and soot soon coats the cool metal.

This demonstrates that the wax in a candle burns pretty completely when there is plenty of air. But when a spoon or other object cuts down the air supply, the carbon from the wax is not burned so completely and may be collected on a cool surface.

If you hold a spoon close over the burning wick of a candle and then look at the color of the soot deposited on it, you will find that not all soot is jet black. In addition to the pure black deposit, some will be gray. Thus in producing carbon black, care must be taken to be sure it always is jet black.

Over one and a half billion pounds of carbon black were produced in the United States last year. This is enough to fill 25,000 freight cars holding 60,000 pounds each. Single plants produce as much as 200,000 pounds a day.

The modern furnace plant is an impressive lay-out with massive steel towers, tanks and superstructure. In the distance it might well be mistaken for an oil-refinery or chemical plant.

Carbon black particles are infinitesimally small, far smaller than those of any other commercial product. Because they are so fine and thus even a small quantity has a large surface area, carbon black has excellent hiding power. The surface area of one pound of carbon black would cover 15 acres. This makes it valuable in inks and paints.

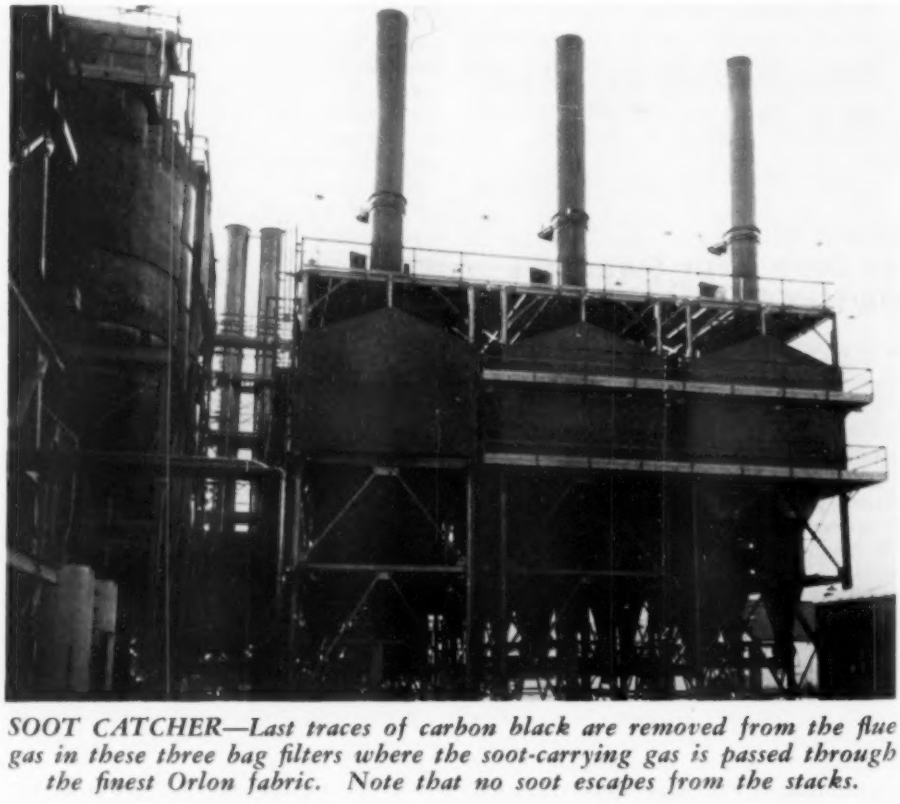
Carbon black has been used as a pigment in printer's ink since the invention of printing. And thousands of years before that the Chinese and Egyptians used it to make permanent symbols. In fact, the oldest Egyptian hieroglyphics on papyrus that we know of were written with carbon ink.

Permanence and surface area are largely responsible for the use of carbon black in printer's ink. Two pounds of carbon black make enough ink to print 67,000 full-size newspaper pages. Each printed letter in a newspaper contains about 8,800 million individual carbon particles, and the dot at the end of this line contains about a billion carbon particles.

Rubber Reinforcement Use

By far the largest use of carbon black is as a reinforcing pigment in rubber. This year well over a billion pounds of carbon black will be mixed with rubber to make it tougher so it will wear better.

Of today's rubber goods, one pound in every five of natural rubber is carbon black, one pound in every three of synthetic rubber is carbon black. Not only is much rub-



SOOT CATCHER—Last traces of carbon black are removed from the flue gas in these three bag filters where the soot-carrying gas is passed through the finest Orlon fabric. Note that no soot escapes from the stacks.

ber saved by the use of carbon black, but the carbon black compounded into tires actually extends the life of a tire at least five times.

When formed, millions of carbon particles cling together in fluffy clusters like bunches of grapes. To break down the clusters, various mills or mixers are used in paint, ink, rubber, paper and other industries.

Carbon Black Size Varies

There is a wide variety of carbon blacks to meet varying demands. Just as carbon black varies in color, so it varies in size. Carbon black particles range in diameter from 10 millimicrons to 300 millimicrons, where a millimicron is a thousandth of a micron or 1/2,500,000,000 of an inch. A blond hair is 50 to 100 microns across, and thus gigantic in comparison. The size of the particles varies with the material used and method of manufacture.

Burn a fresh Brazil nut or a piece of rubber band, and black smoke rises from it. This is soot just as much as the fluffy black material that collects over an oil burner or inside a chimney. It all results from the incomplete burning of oily hydrocarbons such as gas or oil. Intense heat or incomplete combustion cracks up the hydrocarbon molecules and strips off their hydrogen.

Carbon black can be made from anything that releases carbon. Insufficient air, which causes a gas or oil burner to smoke, is the clue to its manufacture. Cost of the raw material pretty much determines the material from which carbon black will be made.

Different Production Methods

Turpentine, for instance, would be an excellent source of carbon black were its cost low enough. Most carbon black is produced from natural gas or oil. Thus carbon black factories are located in the Southwest, right in the natural gas and oil fields.

Carbon black is produced in a number of ways. In making soot with a candle, it was the cold metal surface of the spoon which collected the carbon black. An elaborate form of this is the impingement process. It employs many small flames which strike metal channels or rollers that collect the carbon particles from the flame. These small flames produce the finer carbons.

The furnace process, in contrast, employs relatively huge flames confined in furnaces. The thermal process, which uses gas, employs heated furnaces in which the hydrocarbon gases are decomposed into carbon and hydrogen. In the lampblack process, which produces coarse carbon black, oil is burned in open pans and collected in settling chambers.

Up to a few years ago, practically all the carbon gases are decomposed into carbon the United States. Even today, more is manufactured in the United States than in all other countries combined. Research is now under way to develop finer carbons tailored to meet specific needs. Also there is a concerted effort to increase manufacturing efficiency so more carbon black will be produced for the gas and oil used.

Specimens of carbon black, products using it and a candle for making a little have been collected for you by Science Service. A total of eight specimens, and suggested experiments to perform with them, are included in a kit which you can secure for 75 cents per kit or three for $1.50. Write Science Service, 1719 N St., N.W., Washington 6, D. C., and ask for the Carbon Black kit.

Science News Letter, October 11, 1952

MEDICINE

Rapid Thawing Best As Frostbite Treatment

➤ BEST TREATMENT for frostbitten feet, legs or hands is rapid thawing in a warm bath at a temperature of 95 to 113 degrees Fahrenheit, Drs. Martin A. Entin and Hamilton Baxter of McGill University, Montreal, reported to the American College of Surgeons meeting in New York.

"To be most effective, the thawing must be immediate, rapid and penetrating," they declared. Warm water or diathermy are recommended for the warming. The temperature should not go above 113 degrees Fahrenheit.

Rapid thawing is painful, they pointed out, so sedatives should be given.

Delayed thawing is really mild warming of already thawed tissue and may be harmful, they pointed out. Exposing a frostbitten limb to temperatures higher than 122 degrees Fahrenheit is harmful, their studies showed. Neither ACTH nor another drug, hexamethonium, were found of enough use to be considered practical for treatment of frostbite cases.

In some of the experiments, rats were precooled before their legs were frozen, to simulate the condition of acute frostbite in a foot of an injured soldier following prolonged exposure to the elements on a battlefield. The rats in such experiments lost more tissue than the controls, showing that frostbite is worse in a person who has already been chilled all over before frostbite set in.

Science News Letter, October 11, 1952

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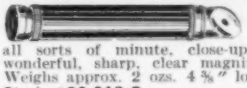

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid in U. S.) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALCOHOL EDUCATION: A Guide-Book for Teachers—Joseph Hirsh and Selma G. Hirsh—*Schuman*, 107 p., $2.50. Designed to highlight the major facts and scientific concepts about alcohol and related problems. Many more Americans drink today than did a hundred years ago; they consume a great deal more alcohol than did our ancestors, but each drinker takes less. Many drink a little; few drink to excess.

ALLIGATORS AND CROCODILES—Herbert S. Zim—*Morrow*, 63 p., illus., $2.00. The life story of these interesting reptiles told simply for children, illustrated with lovely drawings by James Gordon Irving.

CLOUD CHAMBER PHOTOGRAPHS OF THE COSMIC RADIATION — G. D. Rochester and J. G. Wilson with a foreword by P. M. S. Blackett—*Academic Press*, 128 p., illus., $10.80. Including both particular photographs of historic importance and typical examples of the principal phenomena of the subject. Long captions aid in the interpretation of the photographs.

COMMUNITY EDUCATION IN PUERTO RICO—Report by the Division of Community Education, Department of Education, San Juan, Puerto Rico—*Education Clearing House, UNESCO*, 25 p., paper, free upon request to publisher, 19, Avenue Kleber, Paris XVI.

CULTURAL AND PATHOGENIC VARIABILITY IN SINGLE-CONIDIAL AND HYPHAL-TIP ISOLATES OF HELMINTHOSPORIUM TURCICUM PASS.—Alice L. Robert—*Govt. Printing Office*, USDA Technical Bulletin No. 1058, 18 p., illus., paper, 10 cents. The breeding of corn resistant to this corn leaf blight disease is complicated by the fact that the fungus varies so in virulence from one year to another.

A DOCUMENTARY HISTORY OF CHINESE COMMUNISM — Conrad Brandt, Benjamin Schwartz and John K. Fairbank — *Harvard University Press*, 552 p., $7.50. This study of the Russian Research Center presents reliable translations of 40 documents important in the growth of Chinese Communism, together with interpretations showing how the Communists rose to power in China. This work is intended as a tool for breaking through the American ignorance of Asia.

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DOG OWNER'S VETERINARY GUIDE — G. W. Stamm—*Stamm*, 112 p., illus., paper, $1.00. Telling the dog owner what to do about the simple ailments and ordinary care of his pet, and how to understand what the veterinarian does in more serious cases.

EUROPE—Samuel Van Valkenburg and Colbert C. Held—*Wiley*, 2d ed., 826 p., illus., $7.50. This college geography text has been almost completely rewritten, since only the climate and soil of Europe remain unchanged. Death of Ellsworth Huntington since the publication of the first edition necessitated the addition of Colbert C. Held as junior author.

THE EVOLUTION OF CHEMISTRY: A History of Its Ideas, Methods and Materials—Eduard Farber—*Ronald Press*, 349 p., illus., $6.00. Selections from early books and papers are used so far as possible to describe the important investigations of the past.

EXPLORING AUTOMECHANICS — Harold T. Glenn—*Bennett*, 318 p., illus., $3.96. Providing a graded series of projects through which the student must progress and at the same time giving him the theoretical background necessary to understand what he is doing. A text for high school students which will fit them to make minor repairs on the family car.

FROM ATOMOS TO ATOM: The History of the Concept *Atom*—Andrew G. Van Melsen, translated by Henry J. Koren—*Duquesne University Press*, 240 p., $4.25. Tracing the history of the atomic theory from its earliest beginnings in ancient Greek philosophy.

GAS TURBINE POWER — G. M. Dusinberre—*International Textbook Company (Laurel)*, 256 p., illus., $6.00. This elementary text is written from the point of view of the mechanical engineer, not of the aeronautical engineer.

HOW THIN THE VEIL: A Newspaperman's Story of His Own Mental Crack-Up and Recovery — Jack Kerkhoff — *Greenberg*, 311 p., $3.50. It was a depression with two attempts at suicide that took the author as a voluntary patient to the state mental hospital. Here is the story of what happened to him and the other patients he met during a six-week stay.

AN INTRODUCTION TO MEDICAL SCIENCE: An Elementary Text on Pathology—William Boyd—*Lea & Febiger*, 4th ed., 304 p., illus., $4.50. A text intended to give nurses, laboratory technicians and physiotherapists a birdseye view of the whole field of disease. This new edition contains important changes, especially in the sections on treatment.

INTRODUCTORY GENERAL PHYSICS—John Gibson Winans—*Ginn*, 765 p., illus., $5.75. A text for beginning courses in physics emphasizing the experimental approach.

LILLIE'S DEVELOPMENT OF THE CHICK: An Introduction to Embryology—Revised by Howard L. Hamilton—*Holt*, 3d ed., 624 p., illus., $8.50. Through the development of the chick, favorite laboratory subject of the embryologist, the beginning student is introduced to embryology. In this edition, the original text by the late Dr. Frank R. Lillie is largely rewritten.

MODERN PHYSICS: Developments of the Twentieth Century—F. W. Van Name, Jr.—*Prentice-Hall*, 360 p., illus., $5.50. A text for those who have already studied the principles of classical physics and calculus. The era of modern physics starts with the discovery of X-rays in 1895 and of the electron in 1897.

NEW AND UNUSUAL SPECIES OF BRACHIOPODS FROM THE ARBUCKLE GROUP IN OKLAHOMA—G. Arthur Cooper—*Smithsonian*, 35 p., illus., paper, 50 cents.

SOME PAPERS ON THE ROLE OF MUSEUMS IN EDUCATION—D. A. Allan and others—*Education Clearing House, UNESCO*, 37 p., paper, free upon request to publisher, 19, Avenue Kleber, Paris XVI.

STRUCTURAL ASPECTS OF CELL PHYSIOLOGY—Symposia of the Society for Experimental Biology, Number VI—*Academic Press*, 357 p., illus., $7.50. Papers read at a Symposium held at Bristol in July, 1951, the sixth of an annual series.

THE TAJIN TOTONAC: Part 1, History, Subsistence, Shelter and Technology—Isabel Kelly and Angel Palerm—*Govt. Printing Office*, 369 p., illus., paper, $2.75. Report of one of a series of studies being made in collaboration by the Smithsonian and the Escuela Nacional de Antropologia e Historia. The culture of these people of Mexico has been little known, although now a new paved highway connects Papantla with Mexico City.

TREES: A Guide to Familiar American Trees—Herbert S. Zim and Alexander C. Martin—*Simon and Schuster*, 160 p., illus., paper, $1.00. A handy pocket-size book, beautifully illustrated in full color, to aid in identifying those trees you are most likely to see on a Sunday afternoon stroll.

28 SCIENCE FICTION STORIES OF H. G. WELLS—*Dover*, 915 p., $3.95. Two novels and 26 short stories are reprinted in this collection originally published in 1905 by Scribner.

THE WONDERFUL STORY OF HOW YOU WERE BORN—Sidonie Matsner Gruenberg — *Hanover House*, 39 p., illus., $2.00. A charmingly illustrated book for little children. The first part of the book tells the story of birth, answering the questions that the littlest tots ask; the latter part provides sex information for older children.

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CHEMISTRY

Aid Chemical Assay

Neutron irradiation of many different chemicals in atomic reactors gives almost a new dimension to analysis, international conclave finds.

➤ ALMOST A new dimension is given to chemical analysis through use of neutron irradiation from atomic reactors. Neutrons activate impurities so that they give off alpha, beta or gamma radiation, and measurement of this radioactivity allows estimation of impurities in materials when concentrations are as low as one part in a billion.

Such new radiochemical methods were discussed at the International Congress on Analytical Chemistry in Oxford, England, attended by 700 scientists from 21 countries.

How neutron activation allows the determination of trace quantities of the alkali metals was told by Dr. M. T. Kelley of Oak Ridge National Laboratory, Tenn.

Small quantities of uranium in rocks and minerals can be determined by radioactivation, A. A. Smales of Britain's Atomic Energy Research Establishment, Harwell, reported.

Optical methods using ultraviolet, infrared, visible and X-ray illumination are used to detect and determine particular components of complex mixtures in a few minutes. Prof. M. G. Mellon of Purdue University, Lafayette, Ind., discussed ultraviolet determination of arsenic.

Even animals, one-celled creatures and fungi are used to analyze for the amounts of various substances present in materials. Dr. David M. Tennent of Merck Institute, Rahway, N. J., told how to estimate accurately the amount of a bacterial pyrogen, or fever-producer, by injecting some of the unknown material into rabbits and measuring the rise in their temperature.

Dr. L. D. Hunter of the Sloan-Kettering Institute for Cancer Research, New York, told how protozoa can be used for chemical analysis. So much is known about nutrition of both protozoa and fungi that measuring their growth rate, when they are fed an unknown material along with a food lacking one particular ingredient being assayed for, allows determination of vitamins, amino acids or metals in minute concentrations.

New reagents for metal analysis are being developed. Many thousands of organic compounds have been used as bases for sensitive color or spot tests for metals. Prof. Henry Freiser of the University of Pittsburgh told how compounds known as metallic chelates, which are more organic than inorganic, are useful in metal analysis. Made-to-order reagents, whose synthesis will be planned so that the various structural features of the molecules affect their analytical behavior to give more selectivity and sensitivity, are under study.

Science News Letter, October 11, 1952

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Do You Know?

Lemons now can be sorted according to color by machine.

Bees must pollinate about 75,000 *clover* blossoms for every pound of clover seed produced.

Tuberculosis kills more persons in the United States than all other infectious diseases combined.

Sulfur dichloride vapor reacts with many paints, inks and varnishes, causing them to dry in a matter of seconds.

A drive-in *post office* near Long Beach, Calif., now is serving motorists who do not have time to get out of their cars to mail letters, buy stamps and transact other post office business.

Questions

AERONAUTICS—For what length trips would helicopters be quicker than 300-mile-an-hour airplanes? p. 228.

• • •

ARCHAEOLOGY—What is believed to be the oldest town in the world? p. 231.

• • •

GENERAL SCIENCE—What research is now going to be taxed under a new ruling? p. 230.

• • •

MARINE BIOLOGY — At what depth have lobsters now been found off New England? p. 229.

• • •

PHYSICS—How can you make a battery for six cents? p. 229.

What new types of atoms have been discovered? p. 231.

• • •

PHYSIOLOGY—What is believed to be the maximum that a person can drink in 24 hours? p. 233.

• • •

PSYCHOLOGY—How does mental test coaching affect scores? p. 232.

• • •

PUBLIC SAFETY—How can you insure that your sweater will not go up in flames? p. 233.

• • •

Photographs: Cover and p. 230, U. S. Air Force; p. 229, Woods Hole Oceanographic Institution; p. 231, University of Wisconsin; p. 234, Columbian Carbon Company.

AERONAUTICS

Transatlantic Tourist Fare Increases Traffic

➤ TOURIST RATES for airplane trips across the Atlantic are paying off, the International Air Transport Association was told in Switzerland by Sir William P. Hildred, its director general. Transatlantic traffic increased about 50% this year in the first three months the fares were lowered by the scheduled airliners.

Approximately 150,000 persons crossed the North Atlantic by scheduled airliners in May, June and July this year. This compares with 100,000 persons crossing during the same three months of the previous year, before the tourist rates were available. Increase in travel by first class service was only 20%.

The 50% increase in traffic was achieved with only a 10% increase in the number of flights. This means the average passenger load per trip was greater and planes were filled more nearly to their capacities.

The introduction of tourist service has not been without difficulty and has had to be only gradual, he said. Tourist rates have been made possible principally by more economical utilization of aircraft capacity for the purpose of carrying revenue load. This is accomplished by the use of lightweight seats, by omitting passenger "bait" provided in first class service, and by reducing fuel loads through use of more intermediate stops.

Science News Letter, October 11, 1952

Here's the easy way to add sound to your films

the new RCA 16mm Magnetic Recorder-Projector

NOW ADD A SPARKLING, new sound track to every 16mm film you use. And do it in minutes—with the new RCA magnetic recorder-projector.

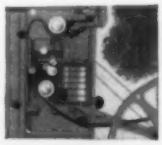
It's the easy, low-cost way to make your films work harder, offer more. With your own sound track on film—old films can tell a new story . . . a general message can be made specific . . . scratched optical sound tracks can be replaced . . . films can speak two languages—one on optical track and the other on magnetic sound track.

With this new RCA projector you can now add sound to your silent films after duplicating on single perforated stock. Or, put a new commentary on your sound films—without impairing your present optical sound track. Add a simple narration, or prepare a complete production in sound.

It's magnificent sound, because it's magnetically recorded sound. And it's just as easy to prepare as a tape recording. To make your own sound track with the RCA magnetic recorder-projector, here's all you do.

1. HAVE MAGNETIC STRIPE ADDED TO YOUR FILM

Laboratories are set up to add a narrow magnetic stripe to your films quickly, expertly—for only a few cents a foot. Exposed film or raw stock can be striped. Sixteen- or 24-frame speed can be used. Double-perforated films (films with two sets of sprocket holes) must be duplicated on single-perforation stock.



2. THREAD PROJECTOR AND SET CONTROLS

Thread the RCA projector as you would for a regular showing. Turn knobs to "record" position, thread film over magnetic recording heads and you're ready to record. No extra gadgets to attach. No extra equipment to set up.

3. WATCH PICTURE—SPEAK INTO MICROPHONE

Record your message on film as you watch the picture. Stop . . . erase . . . re-record at any time. You can plan your recording for a single showing—or use it over and over again.

Compare sound reproduction before you buy

Listen to the magnificent sound reproduction from the RCA magnetic recorder projector before you buy any type of sound projector. You've never heard such faithful sound on 16mm film. And RCA's quiet projector mechanism—the famous "thread-easy" mechanism—keeps irritating projector noise out of your recording. For a superb presentation of either optically or magnetically recorded films, listen to the RCA magnetic recorder-projector. Listen . . . compare . . . before you buy.

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⚙ *ALL-NYLON SHOE laces have a white inner core enclosed in a black or brown cover. Worn laces expose the white core, warning the wearer that a new lace is needed. Extremely strong, the long-lasting cords make good laces for leg braces.*

Science News Letter, October 11, 1952

⚙ *PLASTIC RUG impressed with a rope-mat design protects floors against scuffing. The rugs have a "cushiony" feeling underfoot that makes them useful especially in basements and kitchens as fatigue mats. Available in nine colors, the rug measures 2 by 3 feet.*

Science News Letter, October 11, 1952

⚙ *LAMPSHADES WITH real heather, grass or leaves pressed between sheets of a tough vinyl plastic produce a striking effect in the home. The imprisoned material retains its delicate fibrous structure and can be seen even when the lamp is not on. Dust and grime are quickly wiped from the shades with a damp sponge or cloth.*

Science News Letter, October 11, 1952

⚙ *ILLUMINATED TELEPHONE cover, shown in the photograph, lights up the instant the receiver is taken off the hook, shedding light on the phone's dial. Operating on regular 110-volt power, the case also has a switch that can turn the dial light on*

when the receiver is not lifted, allowing the device to be used as a soft-glowing night light.

Science News Letter, October 11, 1952

⚙ *HOUSEHOLD FIRE extinguisher weighs 2½ pounds and squirts a vaporizing liquid in a 25-foot stream by compressed air controlled by a push-button switch. The extinguisher's air pressure can be recharged at a filling station. Having a stainless-steel shell and a red plastic head, the extinguisher works against ordinary small fires in wood shavings, waste baskets, wiring and household appliances.*

Science News Letter, October 11, 1952

⚙ *FLASH-LAMP LACQUER allows photographers to convert regular flash bulbs into infrared lamps for inconspicuous use with infrared film in dark theaters or during basketball games. The lacquer dries around the bulb, forming a plastic-like coating that filters out most of the visible light.*

Science News Letter, October 11, 1952

⚙ *ELECTRIC MIXER attachment kit will convert an electric food mixer into a light power tool that can polish silverware, sand woods, drill holes and stir paints. The kit comes complete with a metal tool box and an instruction manual.*

Science News Letter, October 11, 1952

⚙ *HAND LAMP especially good for outdoor use at night clamps on a special 7½-volt battery. A high-low switch makes the lamp's brilliance either 21 or 3 candlepower. The light unit itself consists of an adjustable 6-inch chrome plated head and reflector that also can be obtained as a sealed-beam unit.*

Science News Letter, October 11, 1952

• Nature Ramblings •

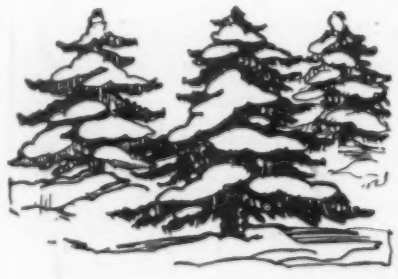
➤ RIGHT NOW, in October, is really the best time to go shopping for your Christmas tree. Not that you will find the street-corner stands stocked with little firs and pines at this time of year.

Christmas trees of that kind will come along, as usual, during the last rushed week or two before Christmas Eve, and will undoubtedly be in bad condition and overpriced—also as usual. And once set up, they will dry and die before the Yule season is ended; they will litter the floor with shed needles, and will be fire hazards and nuisances generally.

This unsatisfactory performance is all you can expect from the conventional Christmas tree. It is really only half a tree anyway; its roots, necessary for maintenance of anything like normal condition, have been amputated and left in the ground. It is a dying tree, and such treatments as setting its base in a can of water or spraying its foliage with preservative formulas only postpone its end a little while.

If you want a normal living Christmas

Shop Early!



tree, now is the time to get it. Nursery stock is still being dug and shipped for fall planting, except in the northernmost areas of this country.

It should not be difficult to find a suitable small evergreen and have it planted in a tub, where it will have a chance to recover from transplantation shock and be in good condition by the time the holiday season arrives.

Your tree need not be moved into the house immediately. It can be left outdoors, on the porch or in the yard, with no more attention than an occasional moderate watering. It will not need much water, even, for growth is now at a standstill and replacement of the relatively small amounts transpired through the foliage is all that is called for.

After it has been moved into the living-room for its brief season of glory, with lights for flowers and lollipops and toys for fruits, your tubbed tree will not need to be flung out, to lie like a reproachful corpse until it is carted away by the trash collector or chopped up to burn in the fireplace. It can be put outdoors again—perhaps into a previously prepared pit among the shrubbery—and left to live through the winter and awaken and grow again in spring, as a normal young tree should.

It can survive to do its Christmas duty year after year, becoming as much a part of the family as the dog or cat.

Science News Letter, October 11, 1952